



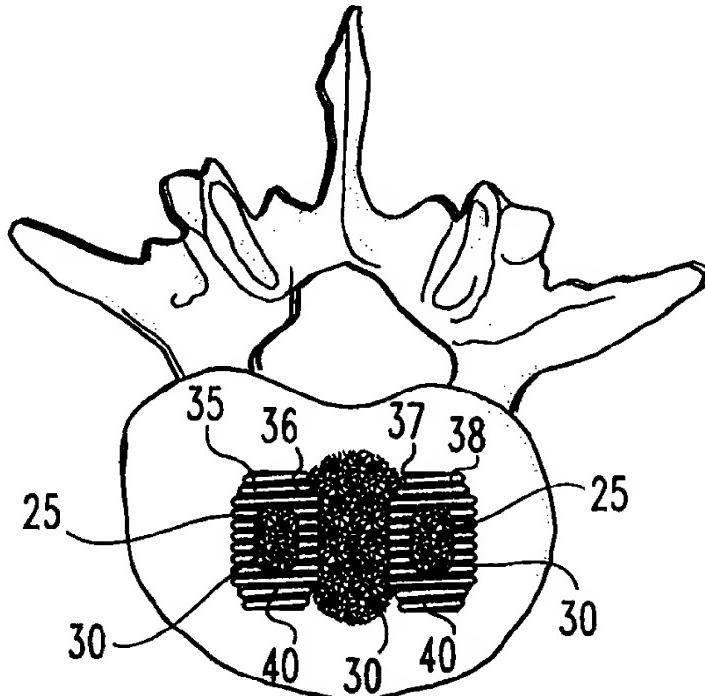
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ :	A3	(11) International Publication Number:	WO 98/17209
A61F 2/44, 2/28		(43) International Publication Date:	30 April 1998 (30.04.98)
(21) International Application Number:	PCT/US97/19108		
(22) International Filing Date:	21 October 1997 (21.10.97)		
(30) Priority Data:	08/740,031 23 October 1996 (23.10.96) US		
(71) Applicant (for all designated States except US):	SDGI HOLDINGS, INC. [US/US]; Suite 508, 300 Delaware Avenue, Wilmington, DE 19801 (US).		
(72) Inventors; and			
(75) Inventors/Applicants (for US only):	PAFFORD, John [US/US]; 2613 Fox Hill Circle East, Germantown, TN 38139 (US). BOYD, Lawrence, M. [US/US]; 5105 Lynbar Avenue, Memphis, TN 38117 (US). MCKAY, William, F. [US/US]; 3870 McElrie Cove, Memphis, TN 38133 (US). RAY, Eddie, F., III [US/US]; 8691 Cedar Farms, Cordova, TN 38018 (US). VAN HOECK, James, E. [US/US]; 754 Tealwood Lane, Cordova, TN 38018 (US).		
(74) Agents:	BECK, Michael, D. et al.; Woodard, Emhardt, Naughton, Moriarty & McNett, Bank One Center/Tower, Suite 3700, 111 Monument Circle, Indianapolis, IN 46204 (US).		
(81) Designated States:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).		
(88) Date of publication of the international search report:	11 September 1998 (11.09.98)		

(54) Title: SPINAL SPACER

(57) Abstract

Spinal spacers (20) are provided for fusion of a motion segment. The spacers include a load bearing member (21) having a wall (22) sized for engagement within a space between adjacent vertebrae to maintain the space and an effective amount of an osteogenic composition (30) to stimulate osteoinduction. The osteogenic composition includes a substantially pure osteogenic factor in a pharmaceutically acceptable carrier. In one embodiment the load bearing member includes a bone graft impregnated in an osteogenic composition. In another embodiment, the osteogenic composition (30) is packed within a chamber (25) defined in the graft. Any suitable configuration of a bone graft is contemplated, including bone dowels, D-shaped spacers and cortical rings.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/19108

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61F2/44 A61F2/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61F A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 97 25945 A (UNIVERSITY OF FLORIDA, TISSUE BANK) 24 July 1997 see the whole document ---	1,8,9, 13-16, 18-25, 36-42
P,X A	WO 96 40013 A (DANEK MEDICAL) 19 December 1996 see page 7 - page 8; figures ---	1-7,69, 70 -/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

23 July 1998

Date of mailing of the international search report

04.08.98

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hagberg, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/19108

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 950 296 A (MCINTYRE) 21 August 1990	1,2, 8-12,25, 26,43
Y	see the whole document	3-7, 13-16, 18,23, 24, 27-37, 41,42, 44-51, 56-68, 70-72
	see column 6, line 41 - line 45; figures ---	
Y	US 5 306 309 A (WAGNER ET AL.) 26 April 1994	27
A	see column 6, line 41 - line 45; figures ---	2,43,67
Y	EP 0 307 241 A (BRANTIGAN) 15 March 1989	13-16, 18,23, 24,36, 37,41, 42, 48-51, 70,71
A	see the whole document ---	52,63-67
Y	US 5 514 180 A (HEGGENESS) 7 May 1996	3-7, 28-35, 44-47
	see column 10, line 49 - column 11, line 56 ---	
P,Y	WO 97 14378 A (DANEK MEDICAL) 24 April 1997	56-65, 68,72
A	see page 10, line 13 - page 13, line 33; figures 8-12 ---	56,58
P,Y	WO 97 15248 A (SYNTHES) 1 May 1997 see page 8 - page 11; figures ---	66,67
A	EP 0 077 159 A (ATKINS ET AL.) 20 April 1983 see abstract -----	8

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 97/19108

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-16, 18-55, 69-71

Spinal spacer including bone graft impregnated with an osteogenic composition

2. Claims: 56-68, 72

Spinal spacer with four walls

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 97/19108

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: 17 because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
Art. 6, PCT: Claim 17 is not clear as the spacer has an anterior, a posterior and two lateral walls, each with opposite ends, in contradiction to being cylindrical as in claim 8, upon which claim 17 is dependent.

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members				International Application No PCT/US 97/19108	
Patent document cited in search report	Publication date	Patent family member(s)		Publication date	
WO 9725945 A	24-07-1997	AU	1700597 A		11-08-1997

WO 9640013 A	19-12-1996	US	5645084 A		08-07-1997
		AU	5939496 A		30-12-1996

US 4950296 A	21-08-1990	NONE			

US 5306309 A	26-04-1994	WO	9515133 A		08-06-1995
		US	5683464 A		04-11-1997

EP 307241 A	15-03-1989	US	4834757 A		30-05-1989
		CA	1292596 A		03-12-1991
		DE	3876909 A		04-02-1993
		US	4878915 A		07-11-1989
		AU	614609 B		05-09-1991
		AU	3436389 A		16-10-1989
		JP	3503133 T		18-07-1991
		WO	8909035 A		05-10-1989

US 5514180 A	07-05-1996	NONE			

WO 9714378 A	24-04-1997	AU	7394496 A		07-05-1997
		AU	7394996 A		07-05-1997
		WO	9714377 A		24-04-1997

WO 9715248 A	01-05-1997	NONE			

EP 77159 A	20-04-1983	JP	58078653 A		12-05-1983
